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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/787,373	02/25/2004	Terence Edwin Dodgson	678-1388	4425

28249 7590 07/21/2006

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EXAMINER	
BROWN JR, NATHAN H	

ART UNIT	PAPER NUMBER
2121	

DATE MAILED: 07/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/787,373	DODGSON, TERENCE EDWIN	
	Examiner	Art Unit	
	Nathan H. Brown, Jr.	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *(3)* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6-8* is/are rejected.

7)☒ Claim(s) *5,9 and 10* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Examiner's Detailed Office Action

1. This Office is responsive to application 10/787,373, filed February 25, 2004.

2. Claims 1-10 have been examined.

Claim Objections

3. "characterised" in claim 1 should be --characterized--.

"therebetween" " in claim 1 should be --there between--.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by *Hassoun*, "Fundamentals of Artificial Neural Networks", 1995.

Regarding claim 1. *Hassoun* teaches a method of training a neural network to perform decoding of a time-varying signal (*see* pp. 254- 259, §5.4.1 Time-Delay Neural Networks) comprising a

sequence of input symbols (*see* Figure 5.4.3 and p. 256, last para. *Examiner interprets u(t) to be input symbols.*), which is coded by a coder (*see* Figure 5.4.3 and p. 257, second para. *Examiner interprets the plant to be a coder and x(t) to be the coded output of the plant.*) such that each coded output symbol depends on more than one input symbol (*see* p. 259, Equation (5.4.4), *Examiner notes the functional dependence of x(t+1) on u(t-1) and u(t).*), characterized by repetitively: providing a plurality of successive input symbols to the neural network and to the coder (*see* p. 258, Figure 5.4.3, *Examiner interprets u(t), u(t-1),...,u(t-m) to be a plurality of successive input symbols to the neural network and plant.*), comparing the network outputs with the input signals (*see* p. 259, Equation (5.4.4), *Examiner notes the gating effect of the product of x(t)x(t-1)x(t-2)u(t-1) in the numerator of (5.4.4) acts as a comparator of network outputs y (i.e., xhat(t+1)) which approximate the plant output x(t) over the training period.*); and adapting the network parameters to reduce the differences there between (*see* p. 259, "Incremental backprop was used to train the network...", *Examiner provides Official Notice that incremental backprop (i.e., error backpropagation) adapts the network parameters (i.e., weights) as a function of the difference between the network output and a target output (e.g., plant output) (see p. 199 Equation (5.1.2)).*).

Regarding claim 2. *Hassoun* teaches a method according to claim 1, further comprising supplying the network not only with the coded output symbols but also with at least some of the plurality of successive input symbols (*see* p. 258, Fig. 5.4.3, *Examiner notes that the plurality of successive input symbols, u(t), u(t-1),..., u(t-m), are input to the neural network along with the coded output symbols x(t), x(t-1),..., x(t-n).*)

7. Claims 3, 4, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by *Wang et al.*, (USPN 5,548,684).

Regarding claim 3. *Wang et al.* teach a method of encoded communications in which input symbols are encoded by convolution (*see* Fig. 1 and col. 5, lines 65-67) to provide, for each input symbol, a plurality of output symbols which depend on the input symbol (*see* col. 1, lines 41-57, *Examiner interprets a bit to be a symbol (of 'yes' or 'no').*), and the input symbol is transmitted together with the plurality of output symbols to a decoder (*see* Fig. 4 and col.6, lines 37-40).

Regarding claim 4. *Wang et al.* teach a neural network for decoding encoded communications in which input symbols are convolutionally encoded (*see* col. 6, lines 32-40) to provide, for each input symbol, a plurality of output symbols which depend on the input symbol (*see* col. 1, lines 41-57, *Examiner interprets a bit to be a symbol (of 'yes' or 'no').*), connected so as to feed back to its inputs least some of the decoded symbols it generates at its outputs (*see* Fig. 5A, item 72, and col. 7, lines 44-49).

Regarding claim 7. *Wang et al.* teach a device according to claim 4, including an integrated circuit comprising a plurality of neuron computation devices operating to perform said neuron computations in parallel (*see* col. 13, lines 20-30, *Examiner interprets a "VLSI implementation" to comprise an integrated circuit.*).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Wang et al.* in view of Moore et al., "Classification of RF transients in space using digital signal processing and neural network techniques", 1995.

Regarding claim 6. *Wang et al.* teach a device according to claim 4. *Wang et al.* do not teach a programmable signal processing device programmed to perform said plurality of neuron computations on a signal. However, *Moore et al.* do teach a programmable signal processing device programmed to perform said plurality of neuron computations on a signal (*see* Abstract, "The FORTE' payload will employ an Event Classifier to perform onboard classification of radio frequency transients from terrestrial sources such as lightning. These transients are often dominated by a constantly

changing assortment of man-made "clutter" such as TV, FM, and radar signals. The FORTE' Event Classifier, or EC, uses specialized hardware to implement various signal processing and neural network algorithms. The resulting system can process and classify digitized records of several thousand samples onboard the spacecraft at rates of about a second per record.", *also see*,

§4. EVENT CLASSTFIER IMPLEMENTATION). It would have been obvious at the time the invention was made to persons having ordinary skill in the art to combine *Wang et al.* with *Moore et al.* for the purpose of allowing onboard classification of radio frequency transients.

Regarding claim 8. *Wang et al.* teach a neural network according to claim 4. *Wang et al.* do not teach a communications terminal device operable to communicate selectively over a communications channel in a plurality of different communications modes, comprising a data processing device for processing time-varying signals, said data processing device being arranged to implement a neural network. *Moore et al.* do teach a communications terminal device (*see* p. 3, Fig. 1, Examiner interprets the FORTE' payload to be a communications terminal device.) operable to communicate selectively over a communications channel in a plurality of different communications modes (*see* p. 3, Fig. 1, Examiner interprets command uplink and data downlink to be different communications modes.), comprising a data processing device for processing time-varying signals (see §4. EVENT CLASSTFIER IMPLEMENTATION, p. 7, Fig. 4, "The C30 DSP performs the computations for the signal preprocessing and classification."), said data processing device being arranged to implement a neural network (*see* §5. DISCUSSION, pp. 9-10). It would have been obvious to persons having ordinary skill in the art at the time of applicant's invention to modify *Wang et al.* as taught by *Moore et al.* for the purpose of allowing onboard classification of radio frequency transients.

Allowable Subject Matter

10. Claims 5, 9, and 10 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan H. Brown, Jr. whose telephone number is 571-272- 8632. The examiner can normally be reached on M-F 0830-1700. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Nathan H. Brown, Jr.
June 6, 2006